

## AMENDMENTS TO THE CLAIMS

1-43 (canceled)

44. (Currently Amended) A signal transmission apparatus for transmitting a first data stream and a second data stream, said signal transmission apparatus comprising:

a modulator operable to modulate the first data stream according to an m-level PSK and modulate the second data stream according to an n-level PSK to produce first and second modulated signals;

a converter operable to convert the first and second modulated signals into first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal;~~ and

a transmitter operable to transmit the first and second converted signals ~~IFFT converted signal;~~

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal ~~for demodulating the modulated signals corresponding to the second data stream.~~

45. (Previously Presented) A signal transmission apparatus according to claim 44, wherein m is less than or equal to 4.

46. (Previously Presented) A signal transmission apparatus according to claim 44, wherein n is greater than or equal to 4.

47. (Previously Presented) A signal transmission apparatus according to claim 44, wherein m is less than or equal to 4 and n is greater than or equal to 4.

48. (Currently Amended) A signal transmission apparatus for transmitting a first data stream

and a second data stream, said signal transmission apparatus comprising:

a modulator operable to modulate the first data stream according to an m-level QAM and modulate the second data stream according to an n-level QAM to produce first and second modulated signals;

a converter operable to convert the first and second modulated signals into first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal~~; and

a transmitter operable to transmit the first and second converted signals ~~IFFT converted signal~~;

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal ~~for demodulating the modulated signals corresponding to the second data stream~~.

49. (Previously Presented) A signal transmission apparatus according to claim 48, wherein m is less than or equal to 4.

50. (Previously Presented) A signal transmission apparatus according to claim 48, wherein n is greater than or equal to 4.

51. (Previously Presented) A signal transmission apparatus according to claim 48, wherein m is less than or equal to 4 and n is greater than or equal to 4.

52. (Currently Amended) A signal receiving apparatus for receiving a first converted signal which is a first modulated signal converted according to Orthogonal Frequency Division Multiplexing and a second converted signal which is a second modulated signal converted according to Orthogonal Frequency Division Multiplexing, said signal receiving apparatus comprising:

a converter operable to convert the received first and second converted signals into the first and second modulated signals;

a Fast Fourier Transformer (FFT) operable to convert an input signal into an FFT converted signal;

wherein the second converted signal has an effective symbol part and a guard interval, the first modulated input signal has information of a first data stream and the second modulated signal has information of a second data stream, the first modulated signal is data stream is modulated according to an m-level PSK modulated signal, the second modulated signal is data stream is modulated according to an n-level PSK modulated signal, and the first data stream has an interval data including information of the guard interval of the second converted signal for demodulating the modulated signals corresponding to the second data stream; and

a demodulator operable to demodulate the first and second modulated signals FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the interval data.

53. (Previously Presented) A signal receiving apparatus according to claim 52, wherein m is less than or equal to 4.

54. (Previously Presented) A signal receiving apparatus according to claim 52, wherein n is greater than or equal to 4.

55. (Previously Presented) A signal receiving apparatus according to claim 52, wherein m is less than or equal to 4 and n is greater than or equal to 4.

56. (Currently Amended) A signal receiving apparatus for receiving a first converted signal which is a first modulated signal converted according to Orthogonal Frequency Division Multiplexing and a second converted signal which is a second modulated signal converted according to Orthogonal Frequency Division Multiplexing, said signal receiving apparatus comprising:

a converter operable to convert the received first and second converted signals into the first and second modulated signals;

~~a Fast Fourier Transformer (FFT) operable to convert an input signal into an FFT converted signal;~~

wherein the second converted signal has an effective symbol part and a guard interval, the first modulated input signal has information of a first data stream and the second modulated signal has information of a second data stream, the first modulated signal is data stream is modulated according to an m-level QAM modulated signal, the second modulated signal is data stream is modulated according to an n-level QAM modulated signal, and the first data stream has an interval data including information of the guard interval of the second converted signal for demodulating the modulated signals corresponding to the second data stream; and

~~a demodulator operable to demodulate the first and second modulated signals FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the interval data.~~

57. (Previously Presented) A signal receiving apparatus according to claim 56, wherein m is less than or equal to 4.

58. (Previously Presented) A signal receiving apparatus according to claim 56, wherein n is greater than or equal to 4.

59. (Previously Presented) A signal receiving apparatus according to claim 56, wherein m is less than or equal to 4 and n is greater than or equal to 4.

60. (Currently Amended) A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus comprising:

a modulator operable to modulate a first data stream according to an m-level PSK and modulate a second data stream according to an n-level PSK to produce first and second

modulated signals, ~~wherein the first data stream has an interval data for demodulating the modulated signals corresponding to the second data stream;~~

a converter operable to convert the first and second modulated signals into first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal;~~ and

a transmitter operable to transmit the first and second converted signals ~~IFFT converted signal;~~

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal;

said signal receiving apparatus comprising:

a ~~converter~~ Fast Fourier Transformer (FFT) operable to convert the transmitted IFFT first and second converted signals ~~signal into an FFT converted signal~~ into the first and second modulated signals; and

a demodulator operable to demodulate the ~~FFT converted signal~~ first and second modulated signals to produce the first data stream and the second data stream, wherein the second data stream is produced according to the interval data.

61. (Previously Presented) A signal transmission system according to claim 60, wherein m is less than or equal to 4.

62. (Previously Presented) A signal transmission system according to claim 60, wherein n is greater than or equal to 4.

63. (Previously Presented) A signal transmission system according to claim 60, wherein m is less than or equal to 4 and n is greater than or equal to 4.

64. (Currently Amended) A signal transmission system comprising a signal transmission

apparatus and a signal receiving apparatus,

said signal transmission apparatus comprising:

a modulator operable to modulate a first data stream according to an m-level QAM and modulate a second data stream according to an n-level QAM to produce first and second modulated signals, ~~wherein the first data stream has an interval data for demodulating the modulated signals corresponding to the second data stream;~~

a converter operable to convert the first and second modulated signals into first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal;~~ and

a transmitter operable to transmit the first and second converted signals ~~IFFT converted signal;~~

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal;

said signal receiving apparatus comprising:

a ~~converter~~ Fast Fourier Transformer (FFT) operable to convert the transmitted ~~IFFT~~ first and second converted signals ~~signal into an FFT converted signal~~ into the first and second modulated signals; and

a demodulator operable to demodulate the ~~FFT converted signal~~ first and second modulated signals to produce the first data stream and the second data stream, wherein the second data stream is produced according to the interval data.

65. (Previously Presented) A signal transmission system according to claim 64, wherein m is less than or equal to 4.

66. (Previously Presented) A signal transmission system according to claim 64, wherein n is greater than or equal to 4.

67. (Previously Presented) A signal transmission system according to claim 64, wherein m is less than or equal to 4 and n is greater than or equal to 4.

68. (Currently Amended) A signal transmission method for transmitting a first data stream and a second data stream, said signal transmission method comprising:

modulating the first data stream according to an m-level PSK and modulating the second data stream according to an n-level PSK to produce first and second modulated signals;

converting the first and second modulated signals into ~~an IFFT~~ first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~signal~~; and

transmitting the first and second converted signals ~~IFFT converted signal~~;

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal ~~for demodulating the modulated signals corresponding to the second data stream.~~

69. (Previously Presented) A signal transmission method according to claim 68, wherein m is less than or equal to 4.

70. (Previously Presented) A signal transmission method according to claim 68, wherein n is greater than or equal to 4.

71. (Previously Presented) A signal transmission method according to claim 68, wherein m is less than or equal to 4 and n is greater than or equal to 4.

72. (Currently Amended) A signal transmission method for transmitting a first data stream and a second data stream, said signal transmission method comprising:

modulating the first data stream according to an m-level QAM and modulating the second data stream according to an n-level QAM to produce first and second modulated signals;

converting the first and second modulated signals into ~~an IFFT~~ first and second converted

signals according to Orthogonal Frequency Division Multiplexing signal; and  
transmitting the first and second converted signals IFFT converted signal;  
wherein the second converted signal has an effective symbol part and a guard interval,  
and the first data stream has an interval data including information of the guard interval of the  
second converted signal for demodulating the modulated signals corresponding to the second  
data stream.

73. (Previously Presented) A signal transmission method according to claim 72, wherein m is less than or equal to 4.

74. (Previously Presented) A signal transmission method according to claim 72, wherein n is greater than or equal to 4.

75. (Previously Presented) A signal transmission method according to claim 72, wherein m is less than or equal to 4 and n is greater than or equal to 4.

76. (Currently Amended) A signal receiving method for receiving a first converted signal  
which is a first modulated signal converted according to Orthogonal Frequency Division  
Multiplexing and a second converted signal which is a second modulated signal converted  
according to Orthogonal Frequency Division Multiplexing, said signal receiving method  
comprising:

converting the received first and second converted signals into the first and second  
modulated signals;

converting an input signal into an FFT converted signal;

wherein the second converted signal has an effective symbol part and a guard interval, the  
first modulated input signal has information of a first data stream and the second modulated  
signal has information of a second data stream, the first modulated signal is data stream is  
modulated according to an m-level PSK modulated signal, the second modulated signal is data  
stream is modulated according to an n-level PSK modulated signal, and the first data stream has



an interval data including information of the guard interval of the second converted signal for demodulating the modulated signals corresponding to the second data stream; and

demodulating the first and second modulated signals ~~FFT converted signal~~ to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the interval data.

77. (Previously Presented) A signal receiving method according to claim 76, wherein m is less than or equal to 4.

78. (Previously Presented) A signal receiving method according to claim 76, wherein n is greater than or equal to 4.

79. (Previously Presented) A signal receiving method according to claim 76, wherein m is less than or equal to 4 and n is greater than or equal to 4.

80. (Currently Amended) A signal receiving method for receiving a first converted signal which is a first modulated signal converted according to Orthogonal Frequency Division Multiplexing and a second converted signal which is a second modulated signal converted according to Orthogonal Frequency Division Multiplexing, said signal receiving method comprising:

converting the received first and second converted signals into the first and second modulated signals;

converting an input signal into an FFT converted signal;

wherein the second converted signal has an effective symbol part and a guard interval, the first modulated input signal has information of a first data stream and the second modulated signal has information of a second data stream, the first modulated signal is data stream is modulated according to an m-level QAM modulated signal, the second modulated signal is data stream is modulated according to an n-level QAM modulated signal, and the first data stream has an interval data including information of the guard interval of the second converted signal for

~~demodulating the modulated signals corresponding to the second data stream; and~~

demodulating the first and second modulated signals ~~FFT converted signal~~ to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the interval data.

81. (Previously Presented) A signal receiving method according to claim 80, wherein m is less than or equal to 4.

82. (Previously Presented) A signal receiving method according to claim 80, wherein n is greater than or equal to 4.

83. (Previously Presented) A signal receiving method according to claim 80, wherein m is less than or equal to 4 and n is greater than or equal to 4.

84. (Currently Amended) A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method comprising:

modulating a first data stream according to an m-level PSK and modulating a second data stream according to an n-level PSK to produce first and second modulated signals, ~~wherein the first data stream has an interval data for demodulating the modulated signals corresponding to the second data stream;~~

converting the first and second modulated signals into first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~an FFT converted signal~~; and

transmitting the first and second converted signals ~~FFT converted signal~~;

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal;

said signal receiving method comprising:

converting the transmitted ~~FFT~~ first and second converted signals ~~signal into an FFT~~

~~converted signal~~ into the first and second modulated signals;

demodulating the ~~FFT converted signal~~ first and second modulated signals to produce the first data stream and the second data stream, wherein the second data stream is produced according to the interval data.

85. (Previously Presented) A signal transmission and receiving method according to claim 84, wherein  $m$  is less than or equal to 4.

86. (Previously Presented) A signal transmission and receiving method according to claim 84, wherein  $n$  is greater than or equal to 4.

87. (Previously Presented) A signal transmission and receiving method according to claim 84, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

88. (Currently Amended) A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method comprising:

modulating a first data stream according to an  $m$ -level QAM and modulating a second data stream according to an  $n$ -level QAM to produce first and second modulated signals, ~~wherein the first data stream has an interval data for demodulating the modulated signals corresponding to the second data stream;~~

converting the first and second modulated signals into first and second converted signals according to Orthogonal Frequency Division Multiplexing ~~an FFT converted signal;~~ and

transmitting the first and second converted signals ~~FFT converted signal;~~

wherein the second converted signal has an effective symbol part and a guard interval, and the first data stream has an interval data including information of the guard interval of the second converted signal;

said signal receiving method comprising:

converting the transmitted ~~FFT~~ first and second converted signals ~~signal into an FFT~~

~~converted signal~~ into the first and second modulated signals;

demodulating the ~~FFT converted signal~~ first and second modulated signals to produce the first data stream and the second data stream, wherein the second data stream is produced according to the interval data.

89. (Previously Presented) A signal transmission and receiving method according to claim 88, wherein  $m$  is less than or equal to 4.

90. (Previously Presented) A signal transmission and receiving method according to claim 88, wherein  $n$  is greater than or equal to 4.

91. (Previously Presented) A signal transmission and receiving method according to claim 88, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.